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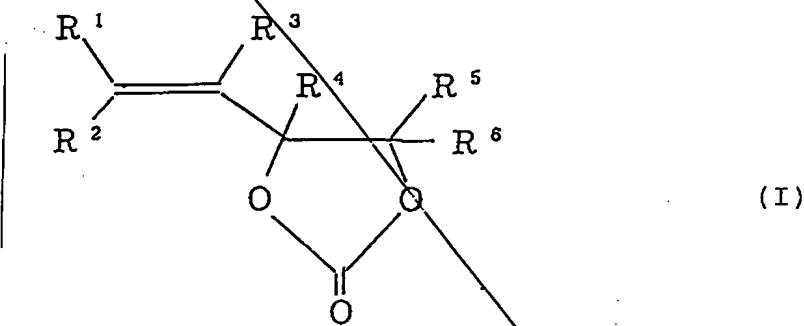
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Claims

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1. A non-aqueous electrolyte secondary battery comprising a negative electrode, a positive electrode and an electrolyte having a lithium salt dissolved in a non-aqueous solvent, characterized in that said non-aqueous solvent contains a vinyl ethylene carbonate compound represented by the following general formula (I) in an amount of from 0.01% to 20% by weight:



wherein R¹, R², R³, R⁴, R⁵ and R⁶ each independently represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

2. The non-aqueous electrolyte secondary battery according to Claim 1, wherein said negative electrode contains a carbon-based material capable of absorbing and releasing lithium.

3. The non-aqueous electrolyte secondary battery according to Claim 2, wherein said carbon-based material capable of absorbing and releasing lithium comprises a carbon-based material having a d value of from 0.335 to 0.34 nm on lattice

plane (002 plane) as determined by X-ray diffractometry.

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4. The non-aqueous electrolyte secondary battery according to any one of Claims 1 to 3, wherein said non-aqueous solvent is a mixed solvent containing a cyclic carbonate selected from the group consisting of alkylene carbonates the alkylene group moiety of which each have from 2 to 4 carbon atoms and a chain carbonate selected from the group consisting of dialkyl carbonate the alkyl group moiety of which each have from 1 to 4 carbon atoms except the vinylethylene carbonate compound of the general formula (I) each in an amount of not smaller than 20 vol-%, with the proviso that the content of said carbonates accounts for not smaller than 70 vol-% based on the total amount thereof.

5. The non-aqueous electrolyte secondary battery according to any one of Claims 1 to 3, wherein said non-aqueous solvent except the vinylethylene carbonate compound of the general formula (I) contains one or more solvents selected from solvents having a relative dielectric constant of not smaller than 25 and exhibits a flash point of not lower than 70°C.

6. The non-aqueous electrolyte secondary battery according to any one of Claims 1 to 3, wherein said non-aqueous solvent except the vinylethylene carbonate compound of the general formula (I) is selected from solvents having a relative dielectric constant of not smaller than 25.

7. The non-aqueous electrolyte secondary battery

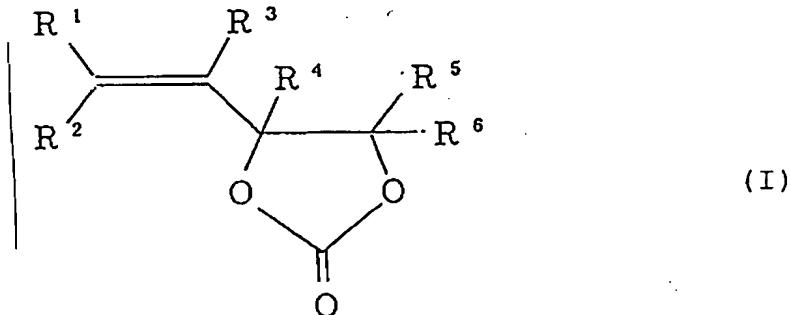
according to Claim 5 or 6, wherein said solvent having a relative dielectric constant of not smaller than 25 is selected from ethylene carbonate, propylene carbonate, butylene carbonate, γ -butyrolactone and γ -valerolactone.

8. The non-aqueous electrolyte secondary battery according to Claim 5 or 6, wherein said solvent having a relative dielectric constant of not smaller than 25 is a mixture of ethylene carbonate and γ -butyrolactone.

9. The non-aqueous electrolyte secondary battery according to any one of Claims 1 to 8, wherein said lithium salt is at least one salt selected from LiClO₄, LiPF₆, LiBF₄, LiCF₃SO₃, LiN(CF₃SO₂)₂, LiN(CF₃CF₂SO₂)₂, LiN(CF₃SO₂) (C₄F₉SO₂) and LiC(CF₃SO₂)₃.

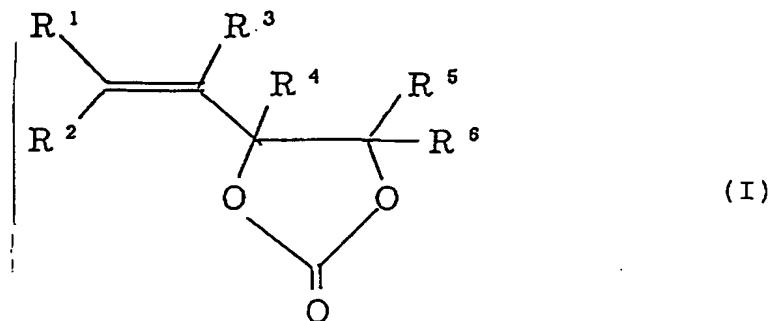
10. A non-aqueous electrolyte for non-aqueous electrolyte secondary battery comprising at least a negative electrode and a positive electrode capable of absorbing/releasing lithium which comprises a solute and a non-aqueous solvent, characterized in that said non-aqueous solvent contains a vinylethylene carbonate compound represented by the following general formula (I) in an amount of from 0.01 to 20% by weight:

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wherein R^1 , R^2 , R^3 , R^4 , R^5 and R^6 each independently represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

11. A non-aqueous electrolyte for non-aqueous electrolyte secondary battery comprising at least a negative electrode and a positive electrode capable of absorbing/releasing lithium which comprises a solute and a non-aqueous solvent, characterized in that said non-aqueous solvent contains one or more solvents selected from solvents having a relative dielectric constant of not smaller than 25 in an amount of not smaller than 90% by weight, exhibits a flash point of not lower than 70°C and comprises at least one vinyl ethylene carbonate represented by the following general formula (I) incorporated therein:



wherein R¹, R², R³, R⁴, R⁵ and R⁶ each independently represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

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